

Ch: 1

Program

- 1) is a number of programming language code that performs certain task(s).
- 2) Only one programmer can design, implement and test the program.

Software

- 1) large complicated program with hundreds of lines of code.
- 2) it needs the cooperation of many individuals to create SW.

software steps 1) Analytic 2) Design 3) Programming
4) testing 5) install

SW: Computer program & associated documentation

→ software product may be developed for particular customer or for general market.

a) Generic
developed ~~for~~ to be sold to range of different customers.

b) Bespoke (custom)

↳ developed for single customer according to their specification.

* System engineering

→ Concerned with all aspects of computer-based systems development including: hardware, software and process engineering.

* Software engineering: part of this process.

* Sys. engineers ⇒ involved in system specification, architectural design, integration and deployment.

SW Crises

Program scaling: add new lines to the same

Program to add new functions.

* Error found, program crash.

* Possible sources of error: reusing names of variables and functions, hard to track the sequence of data flow inside program

SW Engineering

→ it is an engineering discipline which is concerned with all aspects of software production.

→ science concerned with building large and complicated SW systems in a cost effective way.

→ application of systematic, disciplined approach for development, operation and maintenance of SW.

SW Engineer

→ Person responsible for organizing work of the group of persons whom will build the SW.

→ He must have:

* technical aspects (programming, mathematics, test Analysis —)

* Non technical aspects (communication ability both oral and written, management. - -)

challenges Facing SW Engineering

1) Heterogeneity: some of SW systems are allocated on networks as distributed system which will be used by different types of users working types of computers and OSs.

↳ this is Heterogeneity

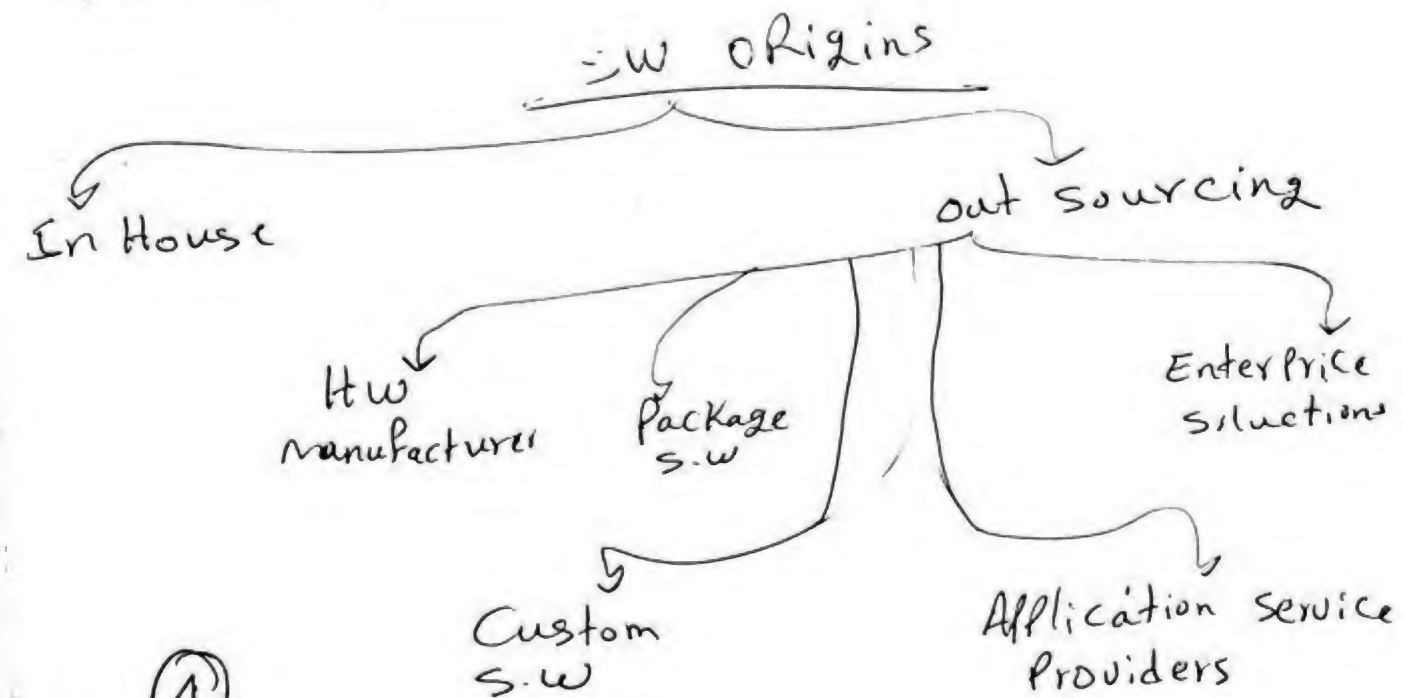
→ It is solved by developing new techniques for building SW that can deal with Heterogeneity without problems.

2) Delivery

- I should deliver my software product with high quality & on the specific time.
- So, steps of developing software must be shorten to cope with this ~~to~~ change of business and users needs.

[3] Trust

- user should trust in software development cause if he ~~not~~ not trust in it, he wouldn't use it.
- we need to develop techniques to ensure the correctness, integrity, completeness, ...etc of these s.w to make user trust it.



Inhouse Development

- 1) Company produces it's own apps.
- 2) ~~all~~ all steps of s.w Development performed ~~at~~ in special dept ~~at~~ at the company.
- 3) no need for external help.

outsourcing

→ there are companies couldn't ~~produce~~ operate In-House by itself.

~ So why outsourcing:-

- a) Cost effective solution.
- b) Reduce time to market.
- c) Increase the revenue.
- d) increase Process efficiencies.
- e) Freeing up internal resources.
- f) Process Knowledge & skills not found internally.

H.w manufacturers

→ like drivers in our computers.

→ IBM Hw Company has the highest sales in s.w (66,451 Millions) in 2007 report.

Packaged SW Producers

ex * microsoft (windows, office)
* oracle (DBMS)

→ These products are generic (for general users) and called off-the-shelf SW.

Advantages	Disadvantages.
→ increase reliability & functionality. → lower initial cost. → in use by other firms. → Help and training comes with software	→ It must accept existing features. → limited customization. → uncertain future of vendor. → less ownership and commitment.

Application Service Providers

→ like video games ~~market~~.

→ apps. are expensive so you go to places to use these apps.

→ They buy apps and make it available for others for a certain price.

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Custom SW Companies

→ Company Consult Custom SW Company to develop a special (custom) SW for this company.

Advantages	Disadvantages.
→ specific response to specialized business needs. → innovation may give competitive edge. → In-house staff for maint maintenance. → pride of ownership.	→ ongoing maintenance. → Necessity of hiring or working with development team. → may be significantly higher initial costs compared to others.

Enterprise solutions

→ we need it Cause Companies around the world are requesting S.Ws for their aspects of work like accounting, distributing

→ difference between this and traditional approach of programming is that we will need a separate system for each function while here all the functions are completing each other.

OpenSource S.W

→ Free S.W that you can obtain without any charge from your side.

→ through it, you have the running version of the software free or even you can get source code itself.

→ you can get codes for encryption, compression, scientific problems, ... and you can change ~~these~~ these codes.

→ ex: linux, Firefox

Criteria for choosing off-the-shelf software

* Cost "inhouse vs purchased"

* ~~Functionality~~ Vendor Support → installation, Technical support, Training.

~~* Vendor support~~

* Functionality → mandatory, essential and desired features.

* Viability of vendor.

* Flexibility (Ease of customization)

* Documentation

↳ user documentation
↳ Technical documentation.

* Response time.

* Ease of installation.

→ Validating purchased SW information:-

- 1) information from vendor.
↳ you give ~~document~~ ~~form~~ online form to vendors to take their suggestions about H.W & system S.W that will meet requirements of your new system.
- 2) Software Evaluation Period.
- 3) Customer references from vendor.
- 4) independent software testing service.

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